



# University of HUDDERSFIELD

## University of Huddersfield Repository

Keraminiyage, Kaushal, Amaratunga, Dilanthi and Haigh, Richard

Enhancing the capacity of Sri Lankan higher education institutions to meet post disaster recovery challenges

### Original Citation

Keraminiyage, Kaushal, Amaratunga, Dilanthi and Haigh, Richard (2008) Enhancing the capacity of Sri Lankan higher education institutions to meet post disaster recovery challenges. In: 4th International i-Rec Conference : Building resilience, 30th April - 2nd May 2008, Christchurch, New Zealand. (Unpublished)

This version is available at <http://eprints.hud.ac.uk/id/eprint/22594/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: [E.mailbox@hud.ac.uk](mailto:E.mailbox@hud.ac.uk).

<http://eprints.hud.ac.uk/>



---

# Enhancing the Capacity of Sri Lankan higher education institutions to meet post disaster recovery challenges

Kaushal Keraminiyage

Email: [K.P.Keraminiyage@salford.ac.uk](mailto:K.P.Keraminiyage@salford.ac.uk)

Prof. Dilanthi Amaratunga

Email: [R.D.G.Amaratunga@salford.ac.uk](mailto:R.D.G.Amaratunga@salford.ac.uk)

Dr. Richard Haigh

Email: [R.P.Haigh@salford.ac.uk](mailto:R.P.Haigh@salford.ac.uk)

## Abstract

Sri Lanka has been identified as one of the worst affected countries from the December 2004 tsunami. Despite large number of relief programmes initiated within Sri Lanka, it has been admitted that the country is yet to recover from the devastation. Among many other reasons lack of intellectual capacities related to the matter has been identified as a major reason behind the largely unsuccessful recovery attempts. These capacity gaps can be traced back to the fact that disaster management related disciplines have not been implemented sufficiently within Sri Lankan higher education institutions.

Addressing this issue, the European and Asian Infrastructure Advantage (EURASIA) research project is initiated which aims at developing a joint curriculum for Built Environment education through an international collaboration between five European and Asian Built Environment educational institutions.

In this context, the primary objective of this paper is to discuss the development of a joint curricular by comparing and assessing the needs and barriers of both the continents. A specific framework has also been developed to assess the compatibility of a developed module or a programme within a specific institution. The paper primarily discusses the methodology adopted for the development of the joint curriculum. Further, the outcomes of the compatibility assessments and skills audits which have been conducted as part of the joint curriculum development have also been discussed with special emphasis given to analyse the applicability of the joint curriculum within context of post tsunami Sri Lanka.

**Keywords:** Capacity Building, Post Tsunami Recovery, Educational Capacity Building, Joint Curricular

## Introduction

Recently the number of disasters throughout the world has risen sharply. The Annual Disaster Statistical Review 2006 (Hoyois et al. 2007) highlights that the number of natural disasters that occurred in the period 1991 to 1999 varied between 200-250, while the figures have almost doubled during the period 2000 and 2006. Along with the continuous and rapid growth in the number of natural disasters, the number of actual victims affected by disasters has varied considerably along the timeline and across regions. During the last two decades, the average annual number of victims affected by natural disasters ranged between 100,000,000 to 300,000,000 (Hoyois et al. 2007). Further, the Asian continent has experienced the greatest loss of life in absolute terms and in proportion to the population, due to natural disasters. As CRED (CRED 2006) reports, the figures accounted for an average of 83.7% people killed in natural disasters in Asia, compared to Europe (10.55%), America (3.54%), Africa (2.16%) and Oceania (0.05%) during the period 2000-2005.

The variation on the effect of disasters between the developed and developing countries visible above has further been highlighted in recent literature (Guha-Sapir et al. 2004; RICS 2006). In their recent “gap report” The RICS (2006) reports 24 out of 49 low-income developing countries face high levels of disaster risk and 6 are hit by two to eight disasters each year. Further, Developing countries experience higher levels of mortality. As an example, the earthquake which hit central California in 2003 with a magnitude of 6.5 in the Richter scale, took two lives and injured 40 people. By comparison, the earthquake which hit Iran four days later with a magnitude of 6.6 in the Richter scale, killed over 40,000 people (NEIC 2003). This mammoth difference in the death toll is not related to population densities, as both events took place in areas with high-density populations (DFID, 2005). Not only the developing countries experience higher levels of mortality during a disaster, they generally require longer periods for post disaster recovery.

Within a typical disaster management scenario, 4 distinguishable stages exist (RICS 2006). Those are:

1. Pre-disaster planning
2. Immediate relief
3. Transitional phase
4. Medium/Long term recovery

Within the pre-disaster planning stage, the vulnerable counties prepare strategies and plans of actions to meet the demands of the future disasters. Just after the disaster itself, the immediate relief stage starts, within which the focus is on providing immediate relief to the victims. Often during this stage, the disaster receives the maximum attention from relief agencies and media exposing the affected communities to possible routes of obtaining required resources and help. After the immediate relief phase, the affected communities often go through a transitional period between the aftermaths of the disaster and their normal way of life. However, without a proper medium/long term plan for the recovery, the affected communities will experience a prolonged transitional period leading to an unsettled society.

As the “Mind the gap” report (RICS 2006) highlights, even though the developing countries often receive financial and other humanitarian support from international communities, nongovernmental organisations and donor agencies as immediate relief aid, generally long-term recovery has primarily been identified as a national, sub-national and local government-led matter. As such, traditionally the donors and other organisations working towards humanitarian relief pay less attention to the long term

recovery aspect of disaster management. Thus, not surprisingly, developing countries who witness disasters, often fail to launch successful long term disaster recovery programmes especially due to lack of resources and capacities, both in financial and intellectual terms. Consequently, this inability hinders the value of the resources dispersed and services rendered by the donor agencies within the immediate relief stage. For these reasons, there is a need to assess the long term disaster recovery issues in developing countries.

Although it is generally accepted that there is always a link between humanitarian actions in immediate rescue / relief programmes and long term recovery and development processes, there is currently no consensus concerning the extent to which humanitarian action should support longer-term needs (ALNAP, 2006). Long-term recovery, however, has always been identified primarily as a national, sub-national and local government-led matter, making the donors and other organisations work towards humanitarian relieves pay lesser attention to this aspect of disaster managements. Thus, not surprisingly, often developing countries fail to launch successful long term disaster recovery programmes especially due to high financial and intellectual resource demands.

### **The case of post tsunami Sri Lanka**

The case of post tsunami Sri Lanka exemplifies the issues related to the post disaster long term recovery in developing countries. Sri Lanka is a small island situated close to southern tip of India near the equator. It is a developing country with the total population just over 20 million. Before the Indian Ocean Tsunami, Sri Lanka was known to be a safe haven where outrages of nature scarcely occurred except for occasional floods and landslides. However, the Tsunami affected 75% of the coastline of Sri Lanka. It also resulted in the destruction of more than 100,000 houses (UNEP 2005) which in turn also resulted in the taking away of several livelihoods such as fishing, farming, tourism and handicrafts-related activities. In addition to commercial and non-commercial property damage, the number of deaths apportioned to the Indian Ocean Tsunami is estimated to be in excess of 130,000 with at least 31,000 of those in Sri Lanka (BBC 2005). The lack of awareness of the nature of a tsunami, among the Sri Lankan public, is quoted as one of the reasons for this mammoth death toll (Karim 2004). Indeed, the term "Tsunami" was heard by most of the ordinary Sri Lankans only after this devastation.

During the immediate relief stage, Sri Lanka received humanitarian relief aid from donors all over the world. This aid was in the form of financial assistance, equipment and materials and human resources for rescue/relief missions. While most of the aid was aimed at providing immediate relief to the victims, some of the funds were meant to be utilized for long term recovery attempts such as reconstruction of houses and infrastructure facilities.

Four years on, Sri Lanka is yet to recover fully from the devastation of the December 2004 tsunami. In fact, after a successful immediate relief phase (Weerakoon et al. 2007), Sri Lanka is going through its transitional period between the short term relief and the medium/long term recovery. The Sri Lankan government started the long term recovery programmes with optimism and expectations for speedy recovery (Weerakoon et al. 2007). In fact the government expected the post tsunami recovery programmes to be completed within 3-5 years (UNDP 2006). Further to this optimism, as Weerakoon et al (Weerakoon et al. 2007) highlights there were pronouncements at political level about even speedier recovery intentions, such as meeting all permanent housing needs within

one year of the devastation. However, this target has not been fully met even after three years (Weerakoon et al. 2007).

### **Disaster Management, Capacity Building and the role of Education**

The UNEP report (2005) highlights the context in which the current post - Tsunami rehabilitation (long term recovery) is operating. Within this report the factors such as pre-existence of very high densities of unplanned settlements in the Southern part of Sri Lanka have been highlighted as influential factors over the operation of the rehabilitation programs. Add to this, the post-Tsunami rehabilitation operations have been affected due to the lack of response capacities in local government institutions to address the needs of such a magnitude. This is mainly because, before the Tsunami, Sri Lanka was known to be a safe haven where outrages of nature scarcely and the strategic and operational level capacities of the institutions responsible for public and commercial facilities were not expected to cater for a devastation of this nature or the scale. As such it has been identified that the capacities of relevant authorities in Sri Lanka need to be improved to launch successful post tsunami recovery programmes and to face any future challenges of the same nature (UNESCO, 2005; ADPC, 2005). As identified by Lagcao (2003), the primary goal of capacity building is to increase an organization's access to information and technical know-how by improving internal management structures, processes and procedures, as well as strengthening partnerships among the various players in the development process. Accordingly, within the context of post – tsunami recovery in Sri Lanka, the aim of providing access to information and technical know-how to the authorities responsible for public and commercial infrastructures, largely resides within the capacity and capability of Higher Education (HE) institutions in Sri Lanka.

Moreover, in order to achieve the desired capacity and the expertise for the re-creation, long term maintenance and management of public and commercial facilities; teaching, training and research related to the discipline will have to be strengthened within the country. While teaching and training sessions can be more appropriate in developing the required capacities in short term, development of a proper research base within the country is required to establish the capacity to ensure successful maintenance and management of these facilities continuously within the country. Thus, from an academic point of view, the post tsunami rehabilitation in Sri Lanka demands an established academic knowledgebase in facilities and infrastructure management.

However, within Sri Lanka, there are no universities with postgraduate degree programmes in this discipline. Despite the increasing recognition of the importance of establishing FM as an important knowledge area, it has been identified that the higher education institutions in Sri Lanka do not have the required capacities in delivering training, teaching and research extensively in the area of FM in terms of initial local expertise and knowledge. Thus, there is a clear and timely requirement to enhance the capacities and research profiles of Sri Lankan HE institutes to support re-creation and long term maintenance of the public and commercial facilities, and related infrastructure through the external (foreign) facilities management expertise.

However, the application of direct foreign knowledge within the given context is not appropriate as there may be mismatches in knowledge application within the Sri Lankan context due to some influential country specific characteristics such as economic condition, government policies and cultural sensitivity. Thus, it is important to make sure that the capacity building related to the facilities management discipline in Sri Lanka is an attempt to use the foreign knowledge on the subject matter to create appropriate knowledge to suite the values, requirements and demands of Sri Lanka.

On the other hand, the current global infrastructure and facilities management knowledge does not reflect adequate coverage required to address the current disaster recovery related issues. As an example, despite the fact that the most advanced Facilities Management (FM) curricula is available within the Europe today, those often show clear gaps related to specific disaster management issues. It is apparent that these gaps can be improved through the potential current natural disaster related cases such as the Indian Ocean tsunami. In context, to address the current disaster recovery management requirements within a global scale, two mutually beneficial actions are required from the global built environment education point of view. Those are; firstly, to update the current global body of knowledge in built environment to address the current disaster management recovery issues, possibly by learning lessons from current global disaster recovery attempts and to disseminate the related knowledge globally so that the desired local knowledge is available when and where required. Secondly, to disseminate currently available knowledge in appropriate form to the areas in need such as to the counties affected by the recent disasters.

## **Research methods**

In the light of the above discussion, the European and Asian Infrastructure Advantage (EURASIA) project has developed a joint curricular on disaster management domain to cover subjects related to main aspects of disaster management including facilities and infrastructure management. This joint curricular is expected to fill the research and teaching capacity gaps in Sri Lankan higher educational institutions on disaster management while ensuring the European partners of the EURASIA project is benefited from an improved curricular by incorporating case study data from the post tsunami Sri Lanka. The next section introduces the EUARSIA project and details the methodology adopted when developing the joint curricular.

### **The EURASIA Project**

The EUROpean and ASian Infrastructure Advantage (EURASIA) is an international collaborative research project with the specific aim of addressing the above highlighted requirement. Five project partners are working in collaboration within this project; three European higher education institutes and two Sri Lankan higher education institutes. The two Sri Lankan partners are specifically the leading higher education institutions that produce construction specialists for the country; namely the University of Moratuwa and the University of Ruhuna. The three European partners are located within United Kingdom, Estonia and Lithuania namely, the University of Salford – United Kingdom, The Tallinn University of Technology - Estonia and Vilnius Gediminas Technical University – Lithuania respectively. There have been a number of FM developments since the early 1990s, with the University of Salford being the leading UK based institution. Over 95% of UK based FM courses are at a Postgraduate level. However, the problem at present is that current UK provision lacks contextual knowledge on facilities and infrastructure management (particularly in association with the natural disasters such as Tsunami) in the South Asian developing economy. Collaboration with Sri Lankan institutions will increase the relevance of such programmes with up-do-date embedded case studies. Both Sri Lankan partners are located within the tsunami affected areas; one being situated within the worst affected southern province will be able to contribute to the

development of case study material in support of the programme. This will be a direct contribution towards support for implementation of capacity building.

In addition to the benefit to the Asian partners, this collaboration is beneficial for the European partners creating a vital win – win situation.

### *Project Aims and Objectives*

Addressing the above highlighted problems and requirements, the EURASIA project sets out its aims and objectives as follows; the project aims to enhance the capacity of the partner institutions for training, teaching and research activities required for the creation and long-term management of public and commercial facilities and infrastructure. It will target (direct) postgraduate students, and junior and senior faculty members from the European Union and Sri Lankan partner institutions and (indirect) researchers, other public sector organisations, consultancies and industry. Thus, in addition to the specific requirement of capacity building within the post tsunami rehabilitation setting in Sri Lanka, the project aims at addressing the facilities management related capacity building requirements within the European Union.

The overall objective of the project is to foster cooperation in Higher Education institutions in both Europe and Asia, improve reciprocal understanding of cultures, exchange best practice and strengthen mutual awareness of programmes.

The project will achieve this by: developing and improving the Sri Lankan and European Union's staff and postgraduate students' professional and research skills associated with the creation and management of facilities and infrastructure, with a clear provision for ensuring equal opportunities and equitable participation of different genders; utilising the teaching experience of the EU University partners to develop a curriculum on the creation and long term management of public and commercial facilities and elements of infrastructure; improving and consolidating academic networks by encouraging systematic exchanges so as to establish a sustainable link between EU and Sri Lankan partner Universities; developing joint institutional systems and procedures for the provision and monitoring of training, teaching and research activities associated with the creation and management of facilities and infrastructure; providing career development opportunities to junior staff through postgraduate study and training programmes with partner Universities; and, disseminating knowledge and interpreting information through joint publications and by conducting lectures, seminars, workshops and conferences.

### *Methodology*

This overall methodology for this project based on 7 work packages (WP). Each work package is administered by at least one lead partner, with all partners assuming responsibility for at least one package. However, partners are encouraged to participate in each of the work packages.

WP1 is responsible for administering the project. All other work packages report progress to WP1, which coordinates work packages and monitors overall progress of the project against objectives, and reports to the Commission. WP2 is primarily responsible for developing a joint outline curriculum on the creation and long term management of public and commercial facilities and elements of infrastructure, which forms the basis for the activities of the Module Development work package (WP3). WP3 is to develop module specifications and associated teaching materials in support of the joint outline curriculum. Work packages 4, 5 and 6 are concerned with developing the human resource capacity of partner Institutions in order that they can support and deliver the new curriculum. These

three work packages will focus on addressing the skill requirements and research gaps identified in WP2. WP5 is concerned with developing the skill base of teaching and research staff, and WP6 will expose staff to different cultural working environments and facilitate exchange of working practices and knowledge between partner Institutions. In this sense, WP5 and WP6 aim to develop the human resources capacity to deliver the new curriculum. WP4 aims to develop longer term capacity in the two Sri Lankan Higher Education Institutes. It focuses on developing two junior members of staff from Sri Lanka, specifically in relation to their research skills. Their studies will focus on specific research gaps in the creation and long term management of public and commercial facilities and elements of infrastructure. The research undertaken and skills developed during the studies will help to develop the curriculum after the project. WP7 is responsible for widening the impact of the project beyond the partner Institutions, thus ensuring that other Asian and EU institutions, as well as industry and relevant bodies, can benefit from the work undertaken. Under WP7, the project will culminate in an International Conference in Sri Lanka that is targeted at academics, industrialists and policy makers concerned with the creation and long term management of public and commercial facilities and elements of infrastructure.

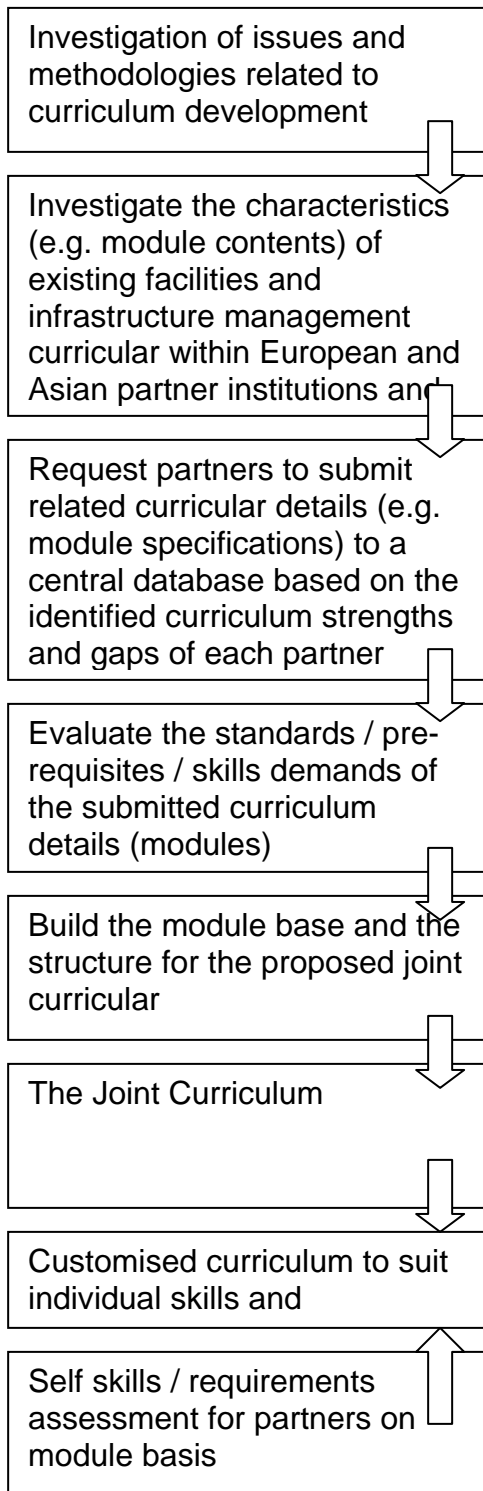
### **Development of the joint Curriculum**

As identified in the previous section, one of the major tasks of the EURASIA project is to develop a joint curriculum related to facilities and infrastructure management compiling the existing European knowledge in the subject area with current case materials from the post Tsunami recovery scenarios in Sri Lanka. The joint curriculum is expected to share among both European and Sri Lankan partners and expected to adopt it to suit the localised needs. The rest of this paper discusses the applied methodology to carry out this task with the intention of evaluating its appropriateness and the academic rigor.

#### *The Curriculum Development Methodology*

The biggest challenge of developing the joint curriculum was to achieve the required standards and still keep it flexible to suit individual needs of all the potential participants. The EURASIA approach to address this need was to identify and address the above aspects of the curriculum within key parameters of the development process. The overall joint curriculum development process can be illustrated as follows.





### Issues and Characteristics of Joint Curriculum Development

The first step of the process was to investigate the issues and methodologies related to the curriculum development. The main focus of this stage was to explore existing literature related to the subject. The scope of this search was determined by the scope of the problem and the scope under which the EURASIA project is operating. As such the literature search was particularly aiming at the curriculum development methodologies

and issues at post graduate level. The search was further refined to capture details related to the joint curriculum development related to the following subject themes.

Built Environment  
Disaster management  
Facilities and Infrastructure management

A detailed analysis about this literature review is in preparation to be published elsewhere and is beyond the scope of this paper. However, through the above search followings have been identified as issues and characteristics related to the joint curriculum development.

1. There is a tendency that the final outcome of the process to be a generic and imbalanced curriculum due to the fact that, it has been designed to cater for different objectives and needs of different participants.
2. The curriculum needs to be flexible enough to cater for different market, quality and skills requirements or different participants.

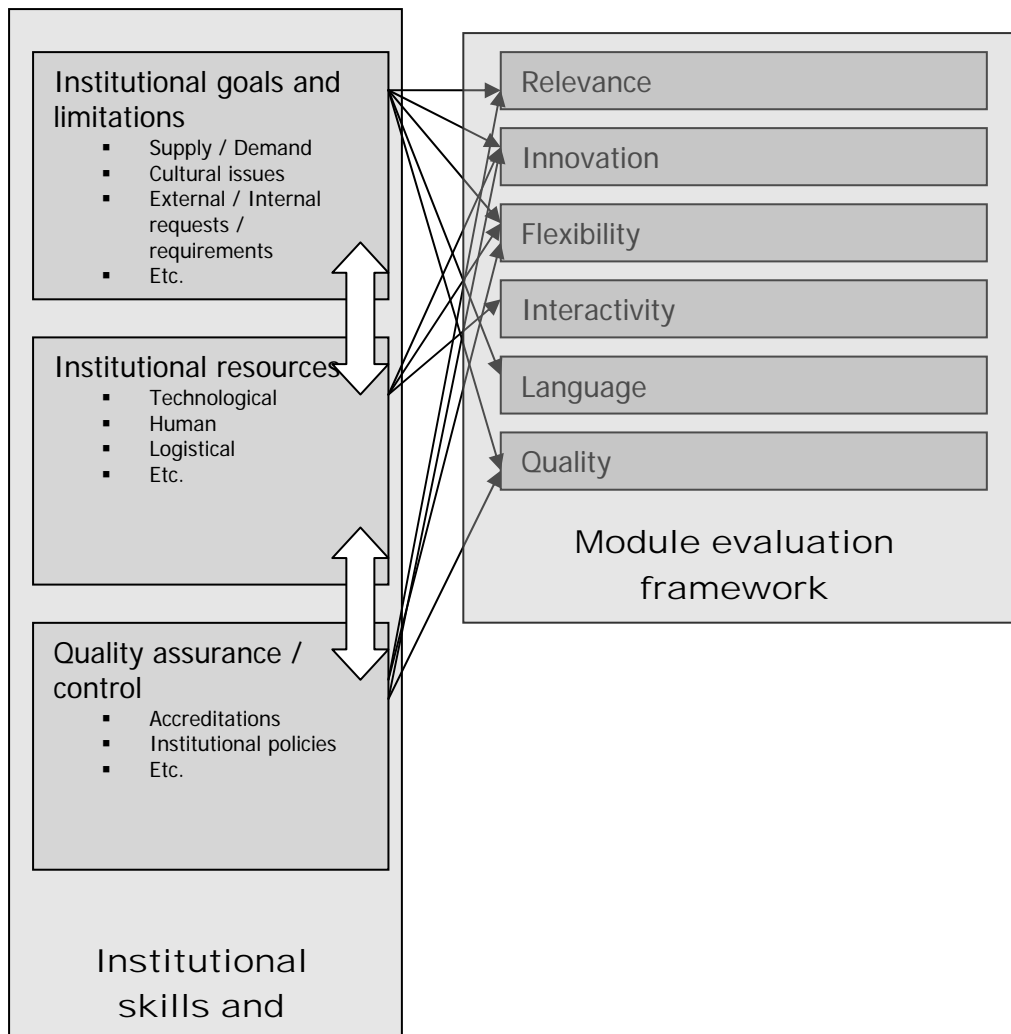
### **Development of the Modules Base**

During the next stage of the curriculum development the focus was mainly on the module structure and the content proposal. The approach was to first investigate the module structure of the existing facilities and infrastructure curricular within European and Asian partner higher education institutions. As mentioned earlier, the Sri Lankan higher education institutions did not have any direct examples of facilities and infrastructure management curricular within their institutions at postgraduate level. However, there were very strong examples of built environment curricular available at these institutions. Moreover, at these institutions, both managerial and engineering disciplines related curricular were present with some indirectly related modules to the infrastructure and facilities management disciplines.

From the European partner's point of view, there were number direct examples of facilities and infrastructure curricular being taught at the partner higher education institutions. However, as mentioned before, the contents of these are conventional and show lack of up to date research knowledge to cater for modern world needs.

As the next step of the process, all the partners were asked to submit any appropriate module specifications that they may have at the time to a central module base. This module base is actually an electronic work space created through a virtual research environment (VRE). This VRE has also been developed as a part of the EURASIA project and is known as VEBER – Virtual Environment for Built Environment Research. (This VRE is accessible via the following URL: <http://veber.buhu.salford.ac.uk>).

### **Standardising The Module Base**



The next challenge of the curriculum development process was to bring the collected modules to a uniform comparable standard. For this purpose, as a part of the EURASIA project a module compatibility framework was developed. The basic premise of this framework is to evaluate each module submitted to the module by using a common toolset. During the process of this framework development, six key areas were identified as main parameters within which the modules should be evaluated. Those are;

- Relevance
- Innovation
- Flexibility
- Interactivity
- Language
- Quality

As the outcome of this process a tool was developed to measure the compatibility of each module submitted. The tool is basically a questionnaire with a Likert Scale. It consists of 14 questions to test the above 6 parameters of the modules within the module base. This questionnaire was made available within VEBER and each time a when a partner submits a module to the module base this questionnaire will have to be filled and a compatibility assessment is done. This in effect is the mechanism to create the module base for the joint curricular.

## **The Skills and Requirement Audit**

During the development of the module compatibility assessment framework, it has been realised that the skills of individual partner organisations have a major impact upon the success of the joint curriculum. The skills differ from organisations to organisation, so as the compatibility of the curriculum within the individual setting. The figure 2 illustrates this link.

With the identifications of the above links, the need for auditing the skills and requirements of the partner institution has been realised. For this purpose, a skills audit framework has been developed within the EURASIA project. This framework again presented in VEBER as a questionnaire with ten questions with a Likert Scale.

## **Curriculum Customisation**

As identified above the institutional requirements and skills differ from a partner to another. This reality defeats the whole purpose of developing a joint curricular if that is to be taken in its literal meaning. Due to this reason, the dissemination of the developed joint curricular takes an innovative approach with the context of the EURASIA project. Rather than forcing all the partner institutions to use a uniform curricular, the EURASIA encourages to build a custom curriculum to each partner based on their skills and requirements, by selecting different combinations of modules from the module base. The module compatibility assessment framework and the skills assessment framework in combination provide the appropriate tools to make this process feasible. However, unlike with the module compatibility assessment framework, the skills and the requirements audit has been planned to carry out during the module requisition stage, so that at the time of building the custom curricular, each institution can test each module against the actual skills and the requirements of the institution.

## **Current Situation and the Conclusion**

The EURASIA is now in its second year and development of the joint curriculum is ongoing. However, the methodology for developing the joint curriculum is fully developed and finalised. This methodology development process provided the basis for this paper.

At present the module base for the joint curriculum is being built by collecting appropriate modules from the partners. So far more than twenty modules were submitted and has gone through the module compatibility assessment process. Module customisation process is the next planned step of the joint curriculum development process. The actual implementation of the customised modules within individual institutions is beyond the scope of the project, however it is the aim of the EURASIA to ensure the joint curricular is ready for the practical implementation at the end the project duration.

## **Acknowledgement**

The authors wish to acknowledge that the EURASIA project is funded by the European Commission under the Asia – Link program. Further, this paper has been produced with the financial assistance of the European Union. The contents of this paper are the sole responsibility of EURASIA and can under no circumstances be regarded as reflecting the position of the European Union.

## References

- BBC. (2005). "At-a-glance: Countries hit - Indian Ocean Tsunami " BBC world news Retrieved 12th October 2007, from <http://news.bbc.co.uk/2/hi/asia-pacific/4126019.stm>.
- CRED (2006). 2006 Disasters in Numbers. Belgium, Centre for Research on the Epistemology of the Disasters (CRED)
- GOSL (2005). Post tsunami recovery and reconstruction, Government of Sri Lanka and Development Partners.
- Guha-Sapir, D., D. Hargitt, et al. (2004). Thirty Years of Natural Disasters 1974-2003: The Numbers. Belgium, Presses universitaires de Louvain.
- Hoyois, P., R. Below, et al. (2007). Annual Disaster Statistical Review: Numbers and Trends 2006. Annual Disaster Statistical Review: Numbers and Trends. Belgium, Centre for Research on the Epistemology of Disasters
- Karim, N. (2004). Options for Floods and Drought Preparedness in Bangladesh. Second International Conference on Post-disaster reconstruction: Planning for Reconstruction. Coventry University, UK.
- NEIC. (2003). "U.S. Geological Survey." Retrieved 27th December, 2006, from [http://neic.usgs.gov/neis/eq\\_depot/2003/eq\\_031222/](http://neic.usgs.gov/neis/eq_depot/2003/eq_031222/).
- RADA (2006). Post Tsunami Recovery and Construction - mid year review. Colombo, Sri Lanka, Reconstruction and Development Agency
- RICS (2006). Mind the Gap! Post-disaster reconstruction and the transition from humanitarian relief, Royal Institution for the Chartered Surveyors.
- UNDP (2006). Post-Tsunami Recovery and Reconstruction Strategy. Colombo, United Nations Development Programme.
- UNEP (2005). Natural Rapid Environmental Assessment – Sri Lanka. Sri Lanka Country Report. Colombo, Sri Lanka, United Nations Environment Programme.
- Weerakoon, D., S. Jayasuriya, et al. (2007). Economic Challenges of Post-Tsunami reconstruction in Sri Lanka. Tokyo, Asian Development Bank Institute.